EFFECTIVENESS OF CONVENTIONAL THERAPY VERSUS CONDUCTIVE EDUCATION ON IMPROVING MOTOR SKILLS AMONG THE CEREBRAL PALSY SUBJECTS

- COMPARATIVE STUDY

A project submitted in partial fulfillment

Of the requirement for the degree of

MASTER OF PHYSIOTHERAPY

Submitted by

Reg no: 271720204

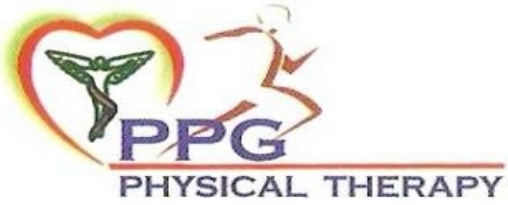
Under the guidance of

PROF. Dr. M. PRADEEPA, MPT (NEURO), MIAP

Submitted to

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY

CHENNAI – 32



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The Dissertation is entitled

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Dissertation evaluated on: …….

INTERNAL EXAMINER **EXTERNAL EXAMINER**

CERTIFICATE I

This is to certify that the project work entitled **EFFECTIVENESS OF CONVENTIONAL THERAPY VERSUS CONDUCTIVE EDUCATION ON IMPROVING MOTOR SKILLS AMONG THE CEREBRAL PALSY SUBJECTS - COMPARATIVE STUDY** was carried out by Reg. No. 271720204 PPG College of Physiotherapy, Coimbatore – 35, affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai -32, under the guidance of **Prof. DR. M. PRADEEPA., MPT(NEURO)., MIAP.**

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CERTIFICATE II

This is to certify that the project work entitled **EFFECTIVENESS OF CONVENTIONAL THERAPY VERSUS CONDUCTIVE EDUCATION ON IMPROVING MOTOR SKILLS AMONG THE CEREBRAL PALSY SUBJECTS - COMPARATIVE STUDY** was carried out by Reg. No. 271720204 PPG College of Physiotherapy, Coimbatore – 35, affiliated to the Tamil Nadu Dr. M.G.R Medical University, Chennai -32, under my guidance and supervision

GUIDE

PROF.DR. M. PRADEEPA, MPT(NEURO), MIAP

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EFFECTIVENESS OF CONVENTIONAL THERAPY VERSUS CONDUCTIVE EDUCATION ON IMPROVING MOTOR SKILLS AMONG THE CEREBRAL PALSY SUBJECTS

- **COMPARATIVE STUDY**

ABSTRACT

BACKGROUND OF THE STUDY: Cerebral Palsy is a movement impairment and organ condition, which is caused by trauma or malfunction of brain regions responsible for motor control [1]. Cerebral palsy children suffer difficulty in motor function (coordination and control). It is found that 10% of the global population has some form of disability from different causes; in India, it is 3.8% of the population. Nearly 15-20% of physically disabled children are affected by Cerebral Palsy. In India, the estimated incidence is around 3/1000 live births. Cerebral palsy is the most common motor disability in childhood.

METHODOLOGY: 30 subjects were selected for this study. Subjects were divided into 2 groups. Group A consisting of 15 subjects and Group B Consisting of 15 subjects. Subjects in group A receives conventional therapy and group B receives conductive education. Both the group received intervention for 45 minutes per session, 5 days in a week for 1 month.

RESULT: The group A pre-test mean score value of functional activity was 148.20 and post-test mean score value of functional activity was 163.33. The group B pre-test mean score value of functional activity was 148.00 and post-test mean score value of functional activity was 172.53.

CONCLUSION: The study concluded that there was statistical improvement in gross motor function after the application of conductive educational therapy for cerebral palsy subjects.

KEYWORDS: Cerebral palsy, Conventional therapy, Conductive educational therapy, Gross motor functional scale.

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CHAPTER I

INTRODUCTION

1.1 BACKGROUND OF THE STUDY:

Cerebral Palsy is a movement impairment and organ condition, which is caused by trauma or malfunction of brain regions responsible for motor control [1]. Cerebral palsy children suffer difficulty in motor function (coordination and control) [2, 3]. The problem and weakness in motor skills can reduce the ability to interact with the social world, and the problem in social interaction, in turn, affects the growth of motor functions [4].

In addition to motor problems, cerebral palsy is often associated with additional neurological disorders, such as learning disabilities, epilepsy, visual impairment, communication disorders, and perception problems [5]. The development and growth of children with cerebral palsy require early intervention [6]. Various interventions are applied to cerebral palsy children, including Physiotherapy [7], Occupational Therapy [8], Auxiliary Technology [9,10], and Neurodevelopmental Therapy [11]

People with cerebral palsy may have problems swallowing and commonly have eye muscle imbalance, in which the eyes don't focus on the same object. People with cerebral palsy also may suffer reduced range of motion at various joints of their bodies due to muscle stiffness. [12]

Cerebral palsy's effect on functional abilities varies greatly. Some affected people can walk while others can't. Some people show normal or near-normal intellectual capacity, but others may have intellectual disabilities. Epilepsy, blindness or deafness also may be present. [13]

It is found that 10% of the global population has some form of disability from different causes; in India, it is 3.8% of the population. Nearly 15-20% of physically disabled children are affected by Cerebral Palsy. In India, the estimated incidence is around 3/1000 live births. Cerebral palsy is the most common motor disability in childhood. Because of the developing

nature of Indian health care in semi-urban and rural areas and the lack of technology used in these areas.

The topographic classification of CP is monoplegia, hemiplegia, diplegia and quadriplegia; monoplegia and triplegia are relatively uncommon. There is a substantial overlap of the affected areas; diplegia is the commonest form at 30% – 40%), hemiplegia is 20% – 30%, and quadriplegia accounts for 10% – 15%. In an analysis of 1000 cases of CP from India, it was found that spastic quadriplegia constituted 61% of cases followed by diplegia 22%. (14) Spastic CP is the commonest and accounts for 70%-75% of all cases, dyskinetic for 10% to 15% and ataxic for less than 5% of cases. (15)

CONDUCTIVE EDUCATION:

Conductive Education Program: The Conductive education program has been developed by Andreas Peto [16]. In the conductive education method, all activities and assignments are targeted and pre-designed, with music and rhythm used to enhance learning capability [17]. The distinction of this method from other rehabilitation methods is the group activities, the use of rhythmic speech and music in exercises, and considering the multidimensional (physical, mental, cognitive, social) development of the child [18]. The conductive education method has five main components as follows:

Conductor: During education, the conductor provides children with an environment full of motivation and encouragement for solving their problems and plans the learning conditions based on their individual needs. Law et al. [19] argued that children in such groups can quickly resolve their problems and rarely encounter problems due to the presence of a conductor.

Treatment Program: The Intensive program is a feature of the conductive education approach.

Task-Series: A set of tasks and exercises designed to achieve physical, social, cognitive and emotional needs, and include a range of functional skills [20].

Rhythmic Speech: In conductive education, rhythmic speech is used simultaneously with motion. In fact, speech is used to illustrate, understand, plan, execute and complete the movements, and controls the speed and rhythm of motion [21].

Group: One of the most important components of conductive education is the group. Children in the group practice socialization and learn how to solve similar problems [22, 23].

Conductive education is the model of education rather than the model of medicinal intervention and, thereby, integrates educational and rehabilitation goals into one program [24]. Conductive education is based on the belief that continuous training of motor patterns will create more effective pathways and communication between motor cortex neurons, which can overcome the trauma and reduce its effects [25].

In conductive education approach, the child with cerebral palsy is taught to employ his/her capabilities to perform physical activities and generalize these skills to various situations of life. In the conductive education method, the activities are presented in group and the use of rhythmic speech and music during activities, as well as paying attention to whole states of children's growth (social, mental, physical, cognitive), are the specific features of this approach [26]. In other words, conductive education includes a combined program of learning motor, personal care, psychological, cognitive, and communication skills in daily life and situations which are age-relevant [27]. This approach focuses on the growth of mental, physical, social, and psychological states to help people with neuro-motor disorders for more efficient performance in daily activities [28].

1.2 NEED OF THE STUDY

Cerebral palsy is the commonly used name for a group of conditions characterized by motor dysfunction due to non-progressive brain damage early in life. Spasticity has been considered to be a main contributor to both the impairment of function and decreased longitudinal muscle growth in the children with spastic CP, leading to deformity.

About 20-30% of people with cerebral palsy have spastic hemiplegia. Spastic implies that the lower extremities are more involved than the upper extremities, but could present with varying degrees of hand function and often involvement is asymmetrical.

Muscle strengthening programs with single joint open kinetic chained and non-weight bearing resistance exercise have been used for the treatment of children with cerebral palsy. They showed improvement in the muscle strength of target muscles, however their effectiveness on motor activities still remains in controversial.

As the activities of daily living are typically of the closed kinetic chain and multiple joint, movement group, a strengthening program with a functional movement pattern has been showed effective in cerebral palsy. Hence, the conductive education program done with closed kinetic chain and improves the functional activities. Here the study shows the additional supportive to the conductive education study to improve gross motor functional activities and reduced the spasticity.

1.3 AIM OF THE STUDY:

To find out the effectiveness of Conventional therapy versus Conductive Education on improving motor skills among the cerebral palsy subjects.

1.4 OBJECTIVE OF THE STUDY

To evaluate the effectiveness of Conventional therapy on improving motor skills in cerebral palsy subject with using of Gross Motor Functional Measurement Scale.

To evaluate the effectiveness of Conductive Education on improving motor skills in cerebral palsy subject with using of Gross Motor Functional Measurement Scale.

To compare the effectiveness of conventional therapy versus Conductive Education on improving motor skills among the cerebral palsy subjects with using of Gross Motor Functional Measurement Scale.

1.5 HYPOTHESIS:

NULL HYPOTHESIS:

There would not have been significant improvement in motor functional skill after application of Conductive Education technique in cerebral palsy subject.

ALTERNATIVE HYPOTHESIS:

There would have been significant improvement in motor functional skill after application of Conductive Education technique in cerebral palsy subject.

1.6 OPERATIONAL DEFINITION

CEREBRAL PALSY

It is defined as a non-progressive neuromotor disorder of cerebral origin. It includes group of heterogenous clinical states of variable etiology and severity ranging from minor incapacitation to total handicap.

-O.P.GHAI

SPASTIC CEREBRAL PALSY

It is the commonest form. Depending on distribution of spasticity, it may be a spastic quadriparesis, Diplegia or hemiparesis.

O.P.GHAI

CONDUCTIVE EDUCATION

Conductive education is a comprehensive method of learning by which individuals with neurological and mobility impairment learn to specifically and consciously perform actions that children without such impairment learn through normal life experiences. Children are encouraged to be problem-solvers and develop a self-reliant "orthofunctional" personality that fosters participation, initiative, determination, motivation, independence, and self-sufficiency.

CHAPTER II

REVIEW OF LITERATURE

REVIEW FOR PREVALENCE

Dr EDWIN Dias (2017)

He did a study on Cerebral palsy in India -A brief overview. It is found that 10% of the global population has some form of disability from different causes; in India, it is 3.8% of the population. Nearly 15-20% of physically disabled children are affected by Cerebral Palsy. In India, the estimated incidence is around 3/1000 live births. Cerebral palsy is the most common motor disability in childhood. There is a substantial overlap of the affected areas; diplegia is the commonest form at 30% – 40%), hemiplegia is 20% – 30%, and quadriplegia accounts for 10% – 15%. In an analysis of 1000 cases of CP from India, it was found that spastic quadriplegia constituted 61% of cases followed by diplegia 22%(1). Spastic CP is the commonest and accounts for 70%-75% of all cases, dyskinetic for 10% to 15% and ataxic for less than 5% of cases.

RAJU SHARMA, et.al.,(2015)

They did a study on Physical profile of children with cerebral palsy in Jalandhar district of Punjab India. They concluded that the census of children with CP of age group 3-13 years of major district of Punjab. Male: female ratio 1.7:1 observed in this study is in agreement with previous studies which CP is more common among boys than among girls. Spastic CP is of 83.46%was most prevalent in all age groups in agreements with previous studies emerged from India and different parts of the world [16].

REVIEW FOR CONDUCTIVE EDUCATION

Myrhaug HT., et al., (2018)

He did a study on the long-term effects of conductive education courses in young children with cerebral palsy: a randomized controlled trial. 21 subjects were participated in this study. The pre and post values are measured by Lincoln-Oseretsky Scale for measuring motor

skills. The study duration was 12 months. Finally, the study concluded that there was no interaction between group assignment and time on functional skills and quality of life in children with CP at 8 and 12 months. Two thirds of the children in both groups performed a large amount of conventional practice. (31)

Negin khoshvaght., et al., (2017)

He did a study on the effectiveness of conductive education on motor skill in children with cerebral palsy. 30 subjects were participated in this study. The outcome measurement was scored by using of Lincoln Oseretsky scale. The findings indicated the effectiveness of conductive education on cerebral palsy children's motor skills. Therefore, it is recommended to design and implement a conductive education program to improve motor skills of cerebral palsy children. (32)

Schenker R., et al., (2016)

He conducted a study on Is a family-centred initiative a family-centred service? A case of a Conductive Education setting for children with cerebral palsy. 38 teacher and 83 families of children with cerebral palsy were participated. The study concluded that Parents and conductors perceive Conductive Education service as being highly family centred in most domains, rating respectful and supportive care the highest and providing general information the lowest, thus indicating an area where improvements should be made. Parents perceived the service they receive to be more family-centred than conductor's perception about their own activities. In addition, educational setting (day care, pre-school and school) was found to be associated with parent's scores. (33)

Yang L., et al., (2009)

He did a study on the efficacy of conductive education combined with Frenkel training in the improvement of balance function in children with cerebral palsy. One hundred and fifteen children with cerebral palsy were randomly administered with conductive education and Frenkel training (study group, n=60) or conventional training (control group, n=55). Activities of daily living (ADL) scale and gross motor function measurement (GMFM) of physical performances were used to assess the balance function. The study concluded that Conductive education

combined with Frenkel training is more effective for the improvement of balance function in children cerebral palsy. (34)

Anttila H., et al., (2008)

The effectiveness of physiotherapy and conductive education interventions in children with cerebral palsy (CP). He conducted a criteria-based appraisal of systematic reviews on the effectiveness of physiotherapy and conductive education interventions in children with cerebral palsy (CP). Computerized bibliographic databases were searched without language restriction up to August 2007. Reviews on trials and descriptive studies were included. Two reviewers independently identified, selected, and assessed the quality of the reviews using the criteria from the Overview Quality Assessment Questionnaire complemented with decision rules. Twenty-one reviews were included, six of which were of high methodological quality. Altogether, the reviews included 23 randomized controlled trials and 104 observational studies on children with CP. The high-quality reviews found some evidence supporting strength training, constraint-induced movement therapy, or hippotherapy, and insufficient evidence on comprehensive physiotherapy and occupational therapy interventions. Conclusions in the other reviews should be interpreted cautiously, although, because of the poor quality of the primary studies, most reviews drew no conclusions on the effectiveness of the reviewed interventions. (35)

Rainer Blank., et al., (2007)

Conductive educational for children with cerebral palsy: effect on hand motor functional relevant to activities of daily living. 64 subjects were participated in this study. The study showed that data on the impact of conductive education block treatment on kinematic and kinetic hand function test in children a with range of severity of CP, intensive conduction education with 3 to 4-week blocks embedded in a 9 months period of conventional treatment and special education improved co-ordinative hand function to be greater extent than special education with conventional treatment alone. (36)

REVIEWS FOR CONVENTIONAL THERAPY

Laura A. Prosser., et al., (2018)

She conducted a study on intensive mobility training with variability and error compared to conventional rehabilitation for young children with cerebral palsy with. 42 subjects were participated in this study. The subjects received treatment for improving motor functional activity for 24 weeks. Finally, the study concluded there was an improvement in motor functional activity after applying of intensive mobility training with variability and error.

Sajan JE., et al., (2017)

He did a study on Wii-based interactive video games as a supplement to conventional therapy for rehabilitation of children with cerebral palsy: A pilot, randomized controlled trial. 10 subjects were participated in each 2 groups. The outcome measures were Posture control and balance, upper limb function, visual-perceptual skills, and functional mobility. The study concluded that Wii-based IVG may be offered as an effective supplement to conventional therapy in the rehabilitation of children with CP.

Bonnechère B., et al., (2017)

He conducted a study on Balance improvement after physical therapy training using specially developed serious games for cerebral palsy children: preliminary results. 10 subjects were participated in this study. The treatment duration for 4 weeks. Trunk control and balance were assessed using Trunk Control Motor Scale (TCMS) before and after interventions. The study showed that SG could therefore be an interesting option to integrate in the conventional treatment of CP children. Implication for Rehabilitation Cerebral palsy (CP) leads to balance issues. Rehabilitation exercises are not performed (enough) at home. Serious games (SG) could increase patients' motivation. SG increase balance control of CP children.

CHAPTER III

MATERIALS AND METHODOLOGY

METHODOLOGY

3.1 STUDY DESIGN

This study is a comparative study

3.2 SAMPLE SIZE

30 Subjects were participated in this study

3.3 STUDY POPULATION

Spastic Cerebral Palsy subjects were taken for the study

3.4 SAMPLING METHOD

Subjects were divided into 2 group by using randomized control method

3.5 STUDY SETTING

The study was conducted in IRHDC, Coimbatore.

3.6 STUDY DURATION

4 months

3.7 SELECTION CRITERIA

INCLUSION CRITERIA

- Spastic cerebral palsy,
- Age group 5 to 14 years,
- Both males and females are included,

- The Gross Motor Functional Classification System Level I or II,
- Able to stand from a chair independently and maintain standing for more than 10 seconds,
- Able to follow verbal instruction,
- Without any limitation in the passive range of motion for lower extremities.

EXCLUSION CRITERIA

- All other types of cerebral palsy,
- Had a botulinum injection for reduce spasticity in lower extremities,
- Subjects with any contracture and deformities,
- Subjects with any cardiac problem (congenitally)
- Children who are having visual and hearing deficits.

3.8 MATERIALS

- Parallel bar,
- Play toys,
- Binoculars,
- Balloon,
- Mat,
- Pen and pencil,
- Scoring sheet,
- Towel.

3.9 MEASUREMENT PARAMETERS

Gross motor functional measurement scale (GMFMS)

3.10 PROCEDURE

30 subjects were selected from IHRDC, Coimbatore. The patient received clear explanation in detail about the aim, intervention of the study. Inform consent form was received from the subject prior to the study. The patient was checked for general and local contra-indication.

The patient was allocated into two groups by using randomized method. Group A consisting of 15 subjects and Group B Consisting of 15 subjects.

Subjects in group A receives conventional therapy and group B receives conductive education. Both the group received intervention for 45 mints per session, 5 days in a week for 1 month.

CONDUCTIVE STUDY

Activity	Task/movement	Reps/Time	Motor Learning and teaching strategies identified during the part (always, often, sometimes, occasionally)
PART 1: GROUP ACTIVITIES ORGANIZED IN A RING			
Welcome songs	Squat-position: Performing arm movements along with the songs	5 min	During part 1: - Visual demonstration (always before and during activities) – Verbal instruction - action (always before and often during activities), e.g. "Now we are going to be elevators. We push 19th floor and stop, then the 38th floor, stop, 101st floor, stop. Ready?" or "Now we are going to stand up. How do we do?" – Verbal instructions - movements (occasionally during activities), e.g. "Can you sit with the feet a bit more together?" – Physical assistance/tactile guidance to children who
"Elevator"	Rising from squat to stand. Stop and hold the position three times during the movement trajectory	A total of 15 reps, 2-3 in a set with breaks sitting on a stool in between	
Clapping and finger games	Sitting on a stool: Finger games like "Itsy Bitzy Spider." Clapping to rhymes involving bending and rotating the trunk, e.g. clapping on opposite shoulder	10 min	
Clapping games and oral motor	Prone lying: Clapping games, waving, pressing a toy that makes bubbles,	12 min	

activities	blowing bubbles		lack ability to perform the action (often three children, amount of guidance vary between and within children; occasionally three children) - Children active in creating the activities e.g. choosing songs, deciding which floor the elevator stops, singing, counting, deciding which animal they want, suggesting variations (often) - Using songs, rhymes, short stories and counting for motivation (often) - Using toys and equipment for motivation (sometimes) - Motivating feedback e.g. "Well done" (occasionally after activities)
Safari	High kneeling and half kneeling. Using arms as binoculars, looking for animals. Reaching for and holding large animal toys, balancing animals on different parts of the body. Dorsal flexion of ankles when crocodile eats on toes	10 min	
Parachute	Sitting, lying and high kneeling: Parachute games like hiding, shaking, para-ball, make balloon fly	15 min	
Hot-dog	Children are wrapped in a mat, "unwrap" themselves by rolling	10 min	

PART 2: INDIVIDUAL ACTIVITIES ORGANIZED AS STATIONS OR OBSTACLE COURSES		
Individual programs of activities	Ball bouncing, throwing and catching Balance on one foot, different surfaces, and heights Crawling over foams of different sizes and shapes Climbing steps or stairs sometimes while carrying a toy Sitting to standing Floor to standing Picking up toys from floor Walk on balance beam, between or over obstacles Climb wall-bars or a climbing wall Crawling over a balance beam fasten to a wall bar Standing with/without support, different surfaces Walking in parallel bars Prone crawling board Three individual sessions during the training, each lasting 10-15 minutes	During part 2: - Verbal instruction from escort (often before and during activities). Action or movement instructions dependent on the escort - Physical assistance/tactile guidance (occasionally or never depending on the activity) - Using toys and equipment for motivation (always) - Motivating feedback, e.g. “Well done” “Come on!”(often during activities) - Feedback on result “You are standing!” (occasionally after activities) - Visual demonstration (occasionally before activities)

PART 3: CLOSING ACTIVITIES			
Stretching	Muscles in legs and arms	8 min	During part 3: - Verbal instruction - movement (always before stretching) - Visual demonstration (always before stretching) - Verbal instruction - action (always –swing) - Songs, music CD and counting for motivation (always) - Physical assistance (always during stretching, two children when climbing into the swing - Children active in creating the activities, e.g. choosing songs, singing, counting, deciding when enough stretch (sometimes during activities) - Motivating feedback, e.g. "Well done" (occasionally after activities)
Large boat swing	Climbing into. Sitting or standing in the swing	10 min	
Reflections/comments	Each child comments on the training	5 min	

CONVENTIONAL THERAPY

The conventional group receive treatment such as passive movements, stretching, muscle strengthening program, weight bearing exercise and gait training process.

Movements

- Active and passive movements for both upper and lower extremities,

Passive stretching

- To the hip flexor, extensors, adductors, hamstring and calf muscles
- Each stretch should be done five times for each session. Hold duration 15 sec and relax 5 sec.

Strengthening exercise

- Static bicycling

Weight bearing exercise

- Single leg standing
- Weight shift to right and left.

Gait training

- Subjects were instructed to walk with long strides and with adequate ground clearance.
- Gait training was also given with the use of floor marking inside a parallel bar for 10 minutes.

CHAPTER IV

DATA ANALYSIS AND RESULT

The GMFM scale (Gross Motor Functional Measurement Scale) were used for analysis the gross functional activity. The pre-test and post-test were evaluated.

STATISTICAL TOOLS

The statistical tool used in the study are paired t-test and unpaired t-test.

PAIRED t – TEST

The paired t-test was used to find out the statistical significance between pre and post t-test values of functional motor function before and after treatment for Group A and Group B.

FORMULA FOR PAIRED t -TEST,

$$S = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$$

$$t = \frac{\bar{d}\sqrt{n}}{s}$$

d	=	difference between the pre-test V_s post test
$\bar{d}$	=	Mean difference
n	=	Total number of subjects
S	=	Standard deviation

UNPAIRED 't'- TEST

The unpaired t-test was used to compare the statistically significance difference of Conventional therapy and conductive educational therapy before and after treatment for Group A and Group B.

FORMULA FOR UNPAIRED t –TEST,

$$S = \sqrt{\frac{(n_1-1){s_1}^2+(n_2-1){s_2}^2}{n_1+n_2-2}}$$

$$t = \frac{|\bar{x}_1-\bar{x}_2|}{s\sqrt{\frac{1}{n_1}+\frac{1}{n2}}}$$

n_1 = Total number of subject in group A

n_2 = Total number of subject in group B

x_1 = Difference between pre- test and post -test of Group A

$\overline{x_1}$ = Mean difference between pre test and post test of group A

X_2 = Difference between pre- testand post- test of Group B

$\overline{X_2}$ = Mean difference between pre- testandpost- test of Group B

S = Standard Deviation

WITHIN GROUP A ANALYSIS FOR GROSS MOTOR FUNCTIONAL

TEST	MEAN VALUE	STANDARD DEVIATION	T VALUE	P VALUE
PRE TEST	148.20	10.46	-24.87	0.000
POST TEST	163.33	9.46		

Table 1: The pre and posttest for functional activity using GMFMS scales.

The pre-test mean score value of functional activity was 148.20 and post-test mean score value of functional activity was 163.33. So, there was statistically significant improvement in functional activity after the application of conventional therapy among cerebral palsy subjects.

WITHIN GROUP B ANALYSIS FOR GROSS MOTOR FUNCTIONAL

TEST	MEAN VALUE	STANDARD DEVIATION	T VALUE	P VALUE
PRE-TEST	148.00	7.78	-29.65	0.000
POST TEST	172.53	9.26		

Table 2: The pre and posttest for functional activity using GMFMS scales.

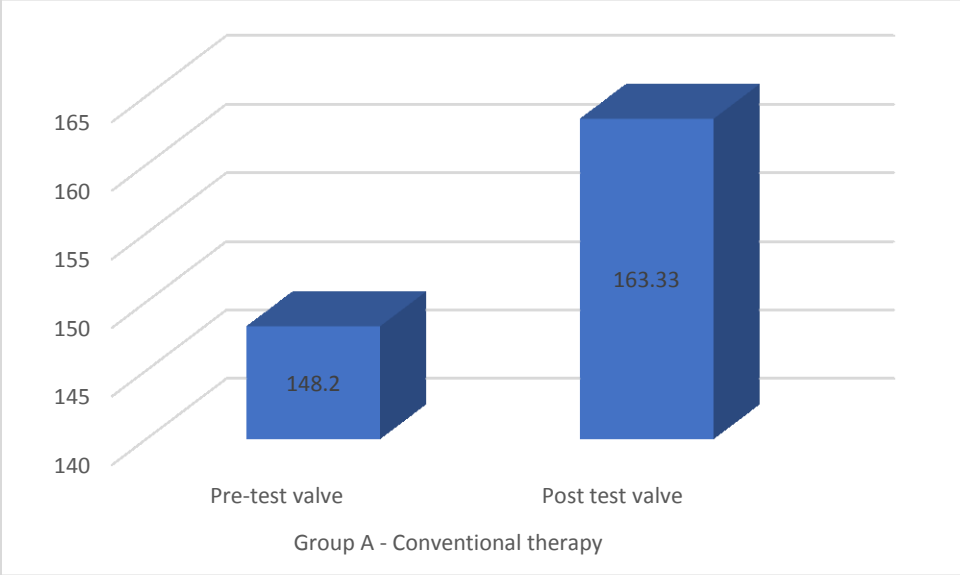
The pre-test mean score value of functional activity was 148.00 and post-test mean score value of functional activity was 172.53. So, there was statistically significant improvement in functional activity after the application of conductive educational therapy among cerebral palsy subjects.

WITHIN GROUP A & B DATA ANLAYIS FOR GMF

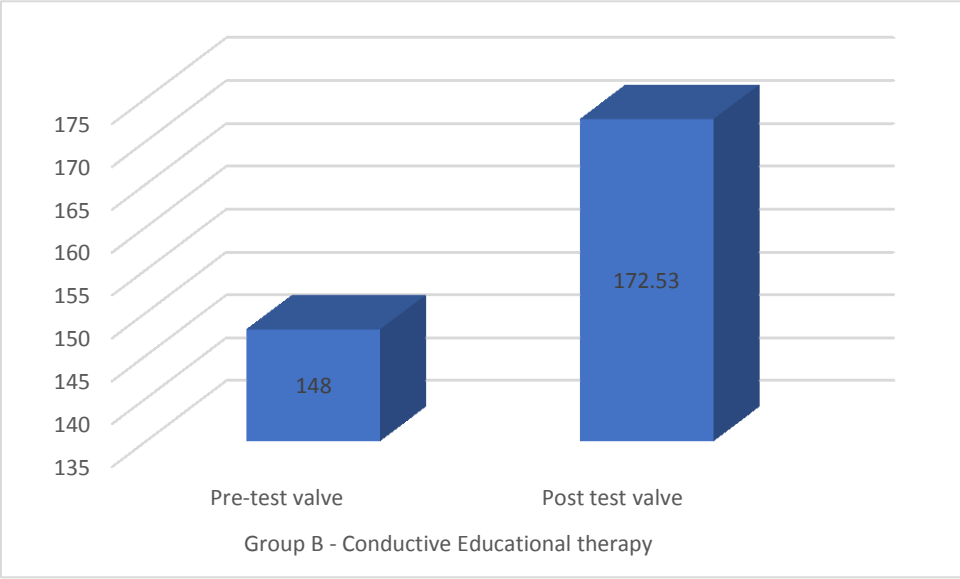
GROUP	**TEST**	**MEAN VALUE**	**STANDARD DEVIATION**	**T VALUE**	**P VALUE**
GROUP A	PRE-TEST	148.20	10.46	-24.87	0.000
	POST TEST	163.33	9.46		
GROUP B	PRE-TEST	148.00	7.78	-29.65	0.000
	POST TEST	172.53	9.26		

Table 3: within group A & B analysis of gross motor functional

The group A pre-test mean score value of functional activity was 148.20 and post-test mean score value of functional activity was 163.33. The group B pre-test mean score value of functional activity was 148.00 and post-test mean score value of functional activity was 172.53. So, there was statistically significant improvement in functional activity in Group B after the application of conductive educational therapy among cerebral palsy subjects.



Graph 1: Graphic representation of pre and post value for Group A



Graph 2: Graphic representation of pre and post value for Group B

CHAPTER V

DISCUSSION

Myrhaug did a study on the long-term effects of conductive education courses in young children with cerebral palsy: a randomized controlled trial. 21 subjects were participated in this study. The pre and post values are measured by Lincoln-Oseretsky Scale for measuring motor skills. The study duration was 12 months. Finally, the study concluded that there was no interaction between group assignment and time on functional skills and quality of life in children with CP at 8 and 12 months. Two thirds of the children in both groups performed a large amount of conventional practice. But this current study shows that significant improvement in gross motor functional activity after application of conductive educational therapy for 4 months.

Negin khoshvaght did a study on the effectiveness of conductive education on motor skill in children with cerebral palsy. 30 subjects were participated in this study. The outcome measurement was scored by using of Lincoln Oseretsky scale. The findings indicated the effectiveness of conductive education on cerebral palsy children's motor skills. Therefore, it is recommended to design and implement a conductive education program to improve motor skills of cerebral palsy children. Here, the study gives a additional supportive for conductive educational therapy to improve the functional activity in cerebral palsy subjects.

Rainer Blank conducted a study on Conductive educational for children with cerebral palsy: effect on hand motor functional relevant to activities of daily living. 64 subjects were participated in this study. The study showed that data on the impact of conductive education block treatment on kinematic and kinetic hand function test in children a with range of severity of CP, intensive conduction education with 3 to 4-week blocks embedded in a 9 months period of conventional treatment and special education improved co-ordinative hand function to be greater extent than special education with conventional treatment alone. The present study shows that 4 months duration of conductive educational therapy result in significant improvement in functional activity.

Laura A. Prosser conducted a study on intensive mobility training with variability and error compared to conventional rehabilitation for young children with cerebral palsy with. 42

subjects were participated in this study. The subjects received treatment for improving motor functional activity for 24 weeks. Finally, the study concluded there was an improvement in motor functional activity after applying of intensive mobility training with variability and error. But, this study show that improvement in functional activity after the application of conductive educational therapy for 4 months.

Sajan JE did a study on Wii-based interactive video games as a supplement to conventional therapy for rehabilitation of children with cerebral palsy: A pilot, randomized controlled trial. 10 subjects were participated in each 2 groups. The outcome measures were Posture control and balance, upper limb function, visual-perceptual skills, and functional mobility. The study concluded that Wii-based IVG may be offered as an effective supplement to conventional therapy in the rehabilitation of children with CP. Here, the study concludes that 4 months of conductive educational therapy would improves the functional activity among the cerebral palsy.

Bonnechère B conducted a study on Balance improvement after physical therapy training using specially developed serious games for cerebral palsy children: preliminary results. 10 subjects were participated in this study. The treatment duration for 4 weeks. Trunk control and balance were assessed using Trunk Control Motor Scale (TCMS) before and after interventions. The study showed that SG could therefore be an interesting option to integrate in the conventional treatment of CP children. Implication for Rehabilitation Cerebral palsy (CP) leads to balance issues. Rehabilitation exercises are not performed (enough) at home. Serious games (SG) could increase patients' motivation. SG increase balance control of CP children. Here, the study concludes that 4 months of conductive educational therapy would improves the functional activity among the cerebral palsy.

CHAPTER VI

SUMMARY AND CONCLUSION

SUMMARY

The present study states that there are few evidences for conductive educational therapy in particularly cerebral palsy. Hence, the study gives an additional supportive for conductive educational therapy. The conductive educational therapy is technique which is used to apply for cerebral palsy. It gently works on coordination and balance and improves the gross motor functional activities. The conventional therapy which is used for reduce the spasticity and improve functional activities. Finally, the result shows that significant improvement in application of conductive educational therapy for cerebral palsy subjects in 4 months of durations.

CONCLUSION

The study concluded that the statistically improvement in gross motor function after the application of conductive educational therapy for cerebral palsy subjects.

CHAPTER VII

LIMITATIONS AND SUGGESTION

LIMITATION

- The study has done with only spastic cerebral palsy,
- The study assessed for short term programme,
- No follow ups have done.
- No. of samples taken for is less.

SUGGESTION

- The study can assign with different types of cerebral palsy,
- Future studies, can be assessed for long term duration,
- Follow ups can be done in future studies either they have maintained or not.

CHAPTER VIII

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CHAPTER IX

ANNEXURE

ANNEXURE I

INFORMED CONSENT FORM

TITLE: EFFECTIVENESS OF CONVENTIONAL THERAPY VERSUS CONDUCTIVE EDUCATION ON IMPROVING MOTOR SKILLS AMONG THE CEREBRAL PALSY SUBJECTS

- **COMPARATIVE STUDY**

INVESTIGATOR:

CO-INVESTIGATOR:

PURPOSE OF THE STUDY:

I …….. Have been informed that this study will help clinicians & therapists to find out the effectiveness of conventional therapy versus conductive education on improving motor skills among the cerebral palsy subjects - comparative study

PRODCEDURE:

I understand that I'll undergo …… under the direct supervision of …….. /……... I am aware that I have to follow therapist's instruction as has been told to me.

RISK AND DISCOMFORT:

I …… understand that there is no potential risk associated with this procedure, and understand that ……. / …….. will accompany me during this procedure.

CONFIDENTIALITY:

I …….. Understand that the medical information produced by this study will be confidential. If the data are used for publication in the medical literature or for teaching purpose, no name will be used. And photographs will be used without identify for publication and presentation.

PHOTOGRAPHY:

……. / …… have explained to me that photography is required in order to illustrate various aspects of the study for the thesis and other articles, and at the presentation or conference. By giving my consent I authorize …… …… / ……. to use any of the photographs taken of me in printed format, in slides for presentation.

REFUSAL OR WITHDRAWAL OF PARTICIPATION:

I ……. Understand that myparticipate is voluntary and I may withdraw consent and discontinue participate at any time after he has explained the reasons for doing so.

INJURY STATEMENT:

I ……. Understand that the diagnostics / procedure, under the guidance of my therapist, is likely to cause any/ no problem. In such case medical attention will be provide, but in compensation will be provided. I understand my agreement to participation in this study and I am not any of my legal rights. I …… confirm that …… and ……... Have explained me the purpose of the study, the study procedure and possible rick that if may experience.

I have read and I have understood this concern to participate as a subject in this study

…….. ……

SUBJECT **DATE**

……. ……

WITNESS TO SIGNATURE **DATE**

I have explained ……. …… …….. The purpose of the research, the procedure required and the possible risks and benefits, to the best of my ability.

INVESTIGATOR DATE

…… ……..

1.

2.

ANNEXURE II

ASSESSMENT CHART

SUBJECTIVE ASSESSMENT:

Name :

Age :

Sex :

Occupation :

Address :

Chief complaints :

History of present illness :

History of past illness :

Family history :

Social and occupational history :

Treatment history :

Prognosis of treatment :

ON OBSERVATION:

Body built :

Swelling :

Muscle wasting :

Deformities :

Redness :

ON EXAMINATION:

Pain :

Muscle power :

Range of motion :

ANNEXURE III

GROSS MOTOR FUNCTIONAL CLASSIFICATION

- **Level 1: walks without restriction, limitations in high level skills**
  - ✓ Walks independently by age 2 years without devices
  - ✓ Walks as preferred mobility by age 4
  - ✓ Difficulty with speed, coordination and balance for high level tasks.
- **Level 2: Walks without devices, limitations walking outdoors.**
  - ✓ Sits with hand supports by age 2,
  - ✓ Crawls reciprocally or walks with device as preferred mobility by age 4
  - ✓ Uses hand to get up from the floor or chair by age 6
  - ✓ Walks indoors with a device by age 12
- Level 3: **Walks with devices, limitations while walking outdoors**
  - ✓ Sits with supports by age 2.
  - ✓ Cruises by age 4, walks with devices for short distances
  - ✓ Does stairs with help by age 6
  - ✓ Walks indoor with a device by age 12
- **Level 4: Limited mobility, powered mobility outdoor**
  - ✓ Rolls by age 2 years
  - ✓ Sits with hand support by age 4,

- ✓ May walk short distance indoors with devices, poor balance,
- ✓ Preferred independent mobility is a wheel chair by age 12.

- **Level 5: Very limited self-mobility, even with assistive technology**
  - ✓ Needs help to roll by age 2.
  - ✓ Does not attain independent mobility by age 12
  - ✓ With high level assistive technology, may learn to use power mobility.

ANNEXURE IV

DATA COLLECTION FOR GROUP A AND GROUP B

S.NO	CONTROL GROUP		EXPERIMENTAL GROUP	
	PRE-TEST	POST TEST	PRE-TEST	POST TEST
1	156.00	166.00	148.00	172.00
2	144.00	157.00	136.00	160.00
3	132.00	150.00	152.00	181.00
4	152.00	168.00	149.00	179.00
5	167.00	180.00	161.00	189.00
6	130.00	148.00	150.00	175.00
7	142.00	160.00	143.00	169.00
8	152.00	168.00	138.00	158.00
9	138.00	152.00	152.00	178.00
10	152.00	168.00	161.00	182.00
11	165.00	180.00	146.00	169.00
12	153.00	168.00	138.00	157.00
13	149.00	162.00	142.00	169.00
14	145.00	163.00	156.00	179.00
15	146.00	160.00	148.00	171.00